

IN THE CLAIMS

1. (Amended) A method of forming an optical component, comprising:
  - forming a mask over a light transmitting medium so as to protect a region of the light transmitting region where a waveguide is to be formed; and
  - applying an etching medium to the light transmitting medium so as to form one or more waveguide surfaces [of the waveguide] with a smoothness less than 220 nm, the etching medium including a fluorine containing gas and one or more partial passivants selected from the group consisting of SiF<sub>4</sub>, C<sub>4</sub>F<sub>8</sub>, CH<sub>2</sub>F<sub>2</sub> and CHF<sub>3</sub>.
2. (Previously presented) The method of claim 1, wherein the fluorine containing gas includes SF<sub>6</sub> and the partial passivant includes CHF<sub>3</sub>.
3. (Previously presented) The method of claim 1, wherein the fluorine containing gas includes SF<sub>6</sub> and the partial passivant includes C<sub>4</sub>F<sub>8</sub>.
4. (Previously presented) The method of claim 1, where the etching medium excludes oxygen.
5. (Previously presented) The method of claim 1, wherein the fluorine containing gas is selected from a group consisting of SF<sub>6</sub>, Si<sub>2</sub>F<sub>6</sub> and NF<sub>3</sub>.
6. (Amended) The method of claim 1, wherein the partial passivant is selected from a group consisting of [HBr, SiF<sub>4</sub>,] C<sub>4</sub>F<sub>8</sub> [, CH<sub>2</sub>F<sub>2</sub>] and CHF<sub>3</sub>.
7. (Previously presented) The method of claim 1, wherein the one or more surfaces includes a sidewall of the waveguide.
8. (Previously presented) The method of claim 1, wherein the one or more surfaces include a waveguide facet.

9. (Previously presented) The method of claim 1, wherein the etching medium is applied at a pressure of 1 mTorr to 600 mTorr.
10. (Previously presented) The method of claim 1, wherein the etching medium is applied at a pressure of 1 mTorr to 60 mTorr.
11. (Previously presented) The method of claim 1, wherein the etching medium is applied at a pressure of 10 mTorr to 30 mTorr.
12. (Previously presented) The method of claim 1, wherein the etching medium includes one or more other media.
13. (Previously presented) The method of claim 1, wherein the one or more other media is selected from the group consisting of SiF<sub>4</sub> and SiF<sub>6</sub>
14. (Previously presented) The method of claim 1, wherein the one or more other media include a noble gas.
15. (Previously presented) The method of claim 1, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of 0.1:1 to 100:1.
16. (Previously presented) The method of claim 1, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of .5:1 to 10:1.
17. (Previously presented) The method of claim 1, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of 1:1 to 2:1.
18. (Previously presented) The method of claim 1, wherein the mask is formed so as to protect a region of the light transmitting region where a plurality of waveguides are to be formed and the etching medium is applied to as to form one or more surfaces on at least one of the waveguides.

19. (Previously presented) The method of claim 1, wherein the mask is an oxide mask.
20. (Previously presented) The method of claim 1, wherein the mask is a photoresist.
21. (Previously presented) The method of claim 1, wherein the etching medium is applied in an inductively coupled plasma etch.
22. (Amended) A method of forming an optical component, comprising:  
obtaining an optical component having a light transmitting medium positioned over a base; and  
applying an etching medium to the light transmitting medium so as to form [at least one surface of a waveguide in the light transmitting medium] one or more waveguide surfaces with a smoothness less than 220 nm, the etching medium including [a fluorine containing gas and] one or more partial passivants and a fluorine containing gas selected from a group consisting of Si<sub>2</sub>F<sub>6</sub> and NF<sub>3</sub>.
23. (Amended) The method of claim 22, wherein the [fluorine containing gas includes SF<sub>6</sub> and] the partial passivant includes CHF<sub>3</sub>.
24. (Amended) The method of claim 22, wherein [the fluorine containing gas includes SF<sub>6</sub> and] the partial passivant includes C<sub>4</sub>F<sub>8</sub>.
25. (Previously presented) The method of claim 22, where the etching medium excludes oxygen.
26. (Amended) The method of claim 22, wherein the fluorine containing gas [is selected from a group consisting of SF<sub>6</sub>, CF<sub>4</sub> Si<sub>2</sub>F<sub>6</sub> and] includes NF<sub>3</sub>.
27. (Previously presented) The method of claim 22, wherein the partial passivant is selected from a group consisting of HBr, SiF<sub>4</sub>, C<sub>4</sub>F<sub>8</sub>, CH<sub>2</sub>F<sub>2</sub> and CHF<sub>3</sub>.

28. (Previously presented) The method of claim 22, wherein obtaining the optical component includes receiving the optical component from a supplier.
29. (Previously presented) The method of claim 22, wherein the etching medium is applied at a pressure of 1 mTorr to 200 mTorr.
30. (Previously presented) The method of claim 22, wherein the etching medium is applied at a pressure of , 5 mTorr to 60 mTorr.
31. (Previously presented) The method of claim 22, wherein the etching medium includes a second fluorine containing gas selected from the group consisting of SiF<sub>4</sub> and SiF<sub>6</sub>.
32. (Previously presented) The method of claim 22, wherein the etching medium also includes a noble gas.
33. (Previously presented) The method of claim 22, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas less than 100:1.
34. (Previously presented) The method of claim 22, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of about .5:1 to 10:1.
35. (Previously presented) The method of claim 22, wherein the etching medium has a molar ratio of partial passivant to fluorine containing gas of about 1:1 to 2:1.
36. (Previously presented) The method of claim 22, wherein the mask is formed so as to protect a region of the light transmitting region where a plurality of waveguides are to be formed and the etching medium is applied to as to form one or more surfaces on at least one of the waveguides.
37. (Previously presented) The method of claim 22, wherein the etching medium is applied so as to form at least one surface on a plurality of waveguides.

38. (Previously presented) The method of claim 22, wherein the etching medium consists of only SF<sub>6</sub> as the fluorine containing gas, CHF<sub>3</sub> as the partial passivant and Oxygen.

39. (Previously presented) The method of claim 22, wherein the etching medium is applied in an inductively coupled plasma etch.

Please add new claims 40 and 41.

40. (Added) The method of claim 1, wherein the etchant is applied so as to form the one or more waveguide surfaces with a smoothness less than 50 nm.

41. (Added) The method of claim 22, wherein the etchant is applied so as to form the one or more waveguide surfaces with a smoothness less than 50 nm.